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ment for the realistic implications intrinsic in the judgment as such seems, after all, curiously like a mere relapse into a pre-Cartesian, even a pre-Protagorean, dogmatism. Doubtless a cognitive process purports to be 'connected with something other than itself,' and the truths which thought thinks are meant to be 'true, not about thought, but about things.' But it is also a peculiarity of the mind that it has the power of self-consciousness, and so is capable of doubting its own success in achieving this 'transcendent reference.' Such a self-conscious 'going-behind' the immediate content of consciousness, such a distinguishing of the thought-process from its potential object, necessarily supervenes in the history of philosophy and in any thoroughgoing reflection by the individual; and for any modern logician or metaphysician this reflective situation is already presupposed. The implications of the proposition that man is a self-conscious animal, Woodbridge hardly seems to have sufficiently considered.

At a moment when a renaissance of realism is in fashion among metaphysicians—Dr. W. P. Montague even contending, in one of the shorter papers here printed, for the physical reality of the secondary qualities—it is interesting to turn to Poincaré's remarkable essay on the present condition of theoretical physics. He exhibits—in a fashion that will seem paradoxical enough to physicists of an older school—all the working principles which physics has long employed, as now subsisting in a very problematical and parlous state, and the concepts of matter and energy as surviving only in a singularly eviscerated form. The uncertainty and provisionality which are thus revealed in the theoretical foundations of the most fundamental of the physical sciences, by one who is perhaps its most eminent living representative, make this paper a noteworthy document in the history of science.

Erdmann's new rehabilitation of the concept of necessary causality appears in a rather bafflingly unidiomatic translation; but so far as one can follow the argument, it does not seem likely to render obsolete Ostwald's remark in the immediately preceding paper, that

"all attempts to prove the general validity of the law of causality have failed, and there has remained only the indication that without this law we should feel an unbearable uncertainty in reference to the world." Erdmann's reasoning, however, is (though distantly related to the argument of Kant's 'Second Analogy of Experience'), original and *gedankenreich*, and it would be profitable to attempt an analytical discussion of it; but the paper is the longest of the series, and a commensurate treatment of it here is forbidden by considerations of space. Like considerations make it necessary to mention a number of the more specialized papers only by title: those of Ormond on 'Present Problems of Metaphysics'; of Pfeiderer and Troeltsch on the 'Philosophy of Religion'; of Sorley and Hensel on 'Ethics'; of H. R. Marshall and Dessoir on 'Esthetics'; of Pierpont on the 'History of Mathematics in the Nineteenth Century'; of Picard and Maschke on 'Algebra and Analysis'; of Darboux and Kasner on 'Geometry.' As has been sufficiently shown, the volume covers a very wide and very mixed field. The selection of these last-named papers for so brief mention is not due to any lack of interest and value on the part of most of them; it is rather due, partly to the limits of the province of this journal, and partly to the limitations of the present reviewer. Those who attended the sessions of the congress will remember that a number of the 'ten-minute papers' were by no means the least profitable part of the proceedings. Of these a few in philosophy, but none in mathematics, are printed—in each case in abridged form. The volume is not free from bad misprints; and most of the translations from French and German (that of Dessoir's paper, by Miss E. D. Puffer, is one exception) seem to be hasty renderings into that unknown tongue which only translators employ.

ARTHUR O. LOVEJOY.

The Eolithic Problem—Evidences of a Rude Industry Antedating the Paleolithic. By GEORGE GRANT MACCURDY.¹

¹*American Anthropologist*, N. S., Vol. 7, pp. 425-479, with five half tone plates reproduced

Within the last decades some of the principal questions regarding the Paleolithic stage in the evolution of man have come to be considered on a fair way to settlement, and the frontier of investigation in prehistoric anthropology has been pushed back into epochs representing the early Quaternary and the Tertiary. Some of the more important problems now under discussion concern the pre-Paleolithic or Eolithic stage and its culture. To these problems relating to the earliest culture of incipient man great interest attaches, and Dr. MacCurdy has materially assisted in making them understood in this country by presenting a clear and admirably constructed paper discussing the present stage of investigation in this field. He has taken the direct route to knowledge by visiting the original European localities and collections in company with investigators who have studied them, and his opinions are those of an unprejudiced observer with the original materials immediately before him. The paper includes an account of the early discoveries, special discussions of the finds in England and Belgium, a chronology of the stone age, and a very useful bibliography of the subject.

Technically, the Eolithic problem concerns the existence in Europe of implement-making and implement-using primates in periods antedating that of the Chellean or early Paleolithic industry. The time of the Chellean industry, or of the beginning of the Paleolithic, is not generally supposed to date back as far as the beginning of Quaternary time. The industry of this epoch is commonly acknowledged to represent a grade of development in implement making too advanced to be considered as the first stage. The stage of Eolithic man represents the epoch of beginnings, in which the first use was made of primitive implements. It is described as commencing at least as early as Miocene time, and extending upward into the early Quaternary.

The industry of Puy-Courny in France represents the late Miocene; the industry of the Chalk Plateau in the south of England, so from photographs of eoliths, and six text figures illustrating the geological relations of implement-bearing beds.

fully discussed by Prestwitt and others, is held to be Pliocene. Other industries of France and England are referred to the late Pliocene. The numerous occurrences in Belgium to which Rutot has devoted himself are early Quaternary.

In a study of the implement-like objects attributed to the work of primitive man-like forms living in the earlier divisions of the Eolithic epoch great difficulties are necessarily met. The first implements were evidently unmodified natural objects. If selected, they were chosen because their original form was more suitable for the purpose in view than that of other objects. The first artifacts were probably unintentionally chipped by use, and this class of objects grades into that showing intentional modification of form. The series leads then from the typical implement to the unmodified natural object, and considerably before the beginning is reached we arrive at a point where it is almost impossible to determine whether or not one is dealing with artifacts.

Having seen a little of the original localities and collections examined by Dr. MacCurdy, it has appeared to the writer that the Eolithic question is really rather sharply divided. The problem of the Belgian Eolithic flints of early Quaternary age seems hardly the same question as that relating to the Pliocene eoliths of the Chalk Plateau in England, or that of the French specimens from the Miocene of Puy-Courny. As is shown by Dr. MacCurdy, the Belgian Eolithic remains, to which he attaches the greatest importance, exhibit in many cases almost undeniable evidence of intentional modification by man. They belong moreover to a period not far antedating the industry of the Chellean epoch, and are not so far removed from the present but that a paleontologist might conceive of the type of primate which made them as existing up to the present day without radical physical changes. On the other hand, the age of the older deposits representing the earlier portion of the Eolithic epoch is so great, that to any one acquainted with the rapid changes of mammalian types in time, it

is difficult to conceive of a form closely related to recent man as extending back to this period. The most that we could imagine would be that the place of man was occupied by some form not higher than the Javan *Pithecanthropus*, and possibly considerably lower than that type, and a question naturally arises as to whether a primate of this stage of evolution would or could make use of implements.

In the case of the eoliths of the Kent Plateau, Dr. MacCurdy has produced evidence which seems to favor intentional modification of form. On the other hand, M. Boule in a recent article² has figured and described most remarkable flint forms resembling eoliths, but produced by the impact on each other of numerous flints carried about in swiftly running water at a cement factory. In such a case as this, in which from the very nature of the problem the discrimination between natural and artificial becomes increasingly difficult, it would appear that other evidence must be called in before we can reach definite conclusions. Apparently the ultimate decision concerning many of the most important points relating to the very early history of man must be determined by purely paleontological observations upon his skeletal remains, and the European record of these is as yet practically a blank for the Eolithic epoch. We shall, however, always obtain a large part of our information concerning early man from studies of the industries which represent him.

In whatever way the question of European Pliocene and Miocene man is finally settled, the present discussion is furnishing the occasion for considerable contributions to our knowledge of the origin and distinctive characters of flaked flints both natural and artificial, and will lead to a much better understanding of this side of the problem. Certainly no possible line of investigation which can furnish us information concerning the earliest man-like types should be neglected. Whether or not we are willing to agree with the investigators in all their conclusions in this particular case, we must certainly com-

mend the earnest and painstaking effort which is being made to come to a clear understanding regarding the significance of the interesting materials now under consideration.

JOHN C. MERRIAM.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for March contains 'Notes on Reptiles and Batrachians of Pennsylvania, New Jersey and Delaware,' by Witmer Stone; 'Anatomy of *Acmaea testudinalis* Muller, Part I., Introductory Material—External Anatomy,' by M. A. Willcox; 'Affinities of Certain Cretaceous Plant Remains commonly referred to the Genera *Dammara* and *Brachyphyllum*,' by A. Hollick and E. C. Jeffrey; 'A New Pycnogonoid from the Bahamas,' by L. J. Cole; and 'Additional Notes on Bahama Snakes,' by T. Barbour.

Bird-Lore for March-April has a well-illustrated article by Herbert K. Job, entitled 'Some Bird Notes from the Magdalens,' 'A Familiar Sparrow Hawk,' by N. C. Brown, and 'Legs and Feet of Birds,' by C. William Beebe, showing their many modifications to adapt them for various uses. Under the section 'For Teachers and Students' we have the fifteenth paper on 'The Migration of Warblers,' by W. W. Cooke, and a 'Brief General Classification of the Songs of Eastern North American Wood Warblers,' by Gerald H. Thayer. In the Audubon Societies is noted the recent unanimous decision by the court of appeals that the sale of foreign game may be prohibited during the close season for similar native species. The Educational Leaflet is devoted to the belted kingfisher and includes a fine colored plate.

The Museums Journal of Great Britain for February contains the program for the July meeting of the Museums Association, which will be held at Bristol. There is an article on the 'Future of Museums,' by H. Bolton, which deals with the relations of provincial to government museums, a phase of museum administration that does not apply to the United States. 'Museums and Private Col-

² M. Boule, 'L'Origine des Eolithes,' *L'Anthropologie*, 1905, T. 16, No. 3, pp. 257-267.